



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,709	02/14/2005	Oug-Ki Lee	21CEN-002PUS	1383
22494 7590 01/23/2007 DALY, CROWLEY, MOFFORD & DURKEE, LLP SUITE 301A 354A TURNPIKE STREET CANTON, MA 02021-2714			EXAMINER ENSEY, BRIAN	
			ART UNIT 2615	PAPER NUMBER

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/524,709	LEE ET AL.	
	Examiner	Art Unit	
	Brian Ensey	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-8 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kang et al. U.S. Patent No. 6,483,917 in view of Sakai U.S. Patent No. 6,850,138.

Regarding claim 1, Kang discloses a subminiature bone conduction speaker using a vibrating plate comprising: a body having a shape of a cylinder of which upper portion is opened (fig 2 element 21, frame); a yoke (fig 2 element 22, column 4 lines 4-5) which is disposed in a lower portion of the body and of which center has a protrusion; a ring type magnet (fig 2 element 23, column 4 lines 6-8) which is formed on the edge of the yoke and apart from an end portion of the protrusion by a predetermined clearance (column 4 lines 6-9); an upper plate which is formed on the magnet (fig 2 element 24, column 4 lines 9-10); a mastoid (fig 2 element 30, vibration contact portion) to transmit a vibration to a skull of a user (fig 3, column 3 lines 27-30 and column 4 lines 40-44) for stimulating an auditory nerve of the user; an acoustic vibrating plate (fig 2 element 27, vibrating plate) which is inserted at a lower side of the mastoid to cover the opening portion of the body and which is made of an elastic material; an auxiliary vibrating plate (fig 2 element 28, coil cap), which is inserted under the acoustic vibrating plate which is inserted to the mastoid; a voice coil (fig 2 element 25A, column 3 lines 64-67) which is attached to the auxiliary vibrating plate and which is inserted between the end portion of the protrusion of the

Art Unit: 2615

yoke and the ring type magnet (column 4 lines 6-17); a front cap (fig 2 element 29, vibration stabilizer) for fixing the acoustic vibrating plate on the body; and an electrical signal input unit (fig 1 element 5, amplifying circuit, column 5 lines 58-61) for inputting an electric signal to the voice coil. Kang does not explicitly teach that the acoustic vibrating plate (fig 2 element 27, vibrating plate) is made of elastic material. However, the use of elastic materials for acoustic vibrating plates is well known in the art and Sakai teaches an acoustic vibrating plate (fig. 1B element 5, suspension plate) is made of the elastic material (Sakai, column 3 lines 40-43). Therefore, It would have been obvious to one of ordinary skill in the art, at the time of Kang's invention to a well-known elastic spring material for the acoustic vibrating plate as taught by Sakai for elastically suspending the vibrating member (See Sakai col. 3, lines 8-18)

Regarding claim 3, the combination of Kang in view of Sakai further discloses the acoustic vibrating plate (fig. 1B element 5, suspension plate) is made of beryllium copper (See Sakai, column 3 lines 40-43).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kang in view of Sakai as applied to claim 1 above, and further in view of Borwick ("Loudspeaker and Headphone Handbook", third edition, John Borwick).

Regarding claim 4, the combination of Kang in view of Sakai teaches a subminiature bone conduction speaker as claimed. The combination of Kang in view of Sakai teaches of using a ring magnet but does not specifically disclose that it is comprised of a neodymium alloy. However, Borwick discloses that magnets made of neodymium are very powerful and that about 10% of the volume of a ferrite magnet, would be required of the neodymium alloy to produce the same magnetic field as the ferrite (pages 57 paragraph 3). Therefore, it would have been obvious

Art Unit: 2615

to one of ordinary skill in the art at the time of the invention to use a ring magnet comprised of neodymium in the combination of Kang in view of Sakai to achieve a higher performance from the magnet and reduce the required magnet size.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kang in view of Sakai as applied to claim 1 above, and further in view of Han (WO 02/25989 A1).

Regarding claim 5, the combination of Kang in view of Sakai teaches a subminiature bone conduction speaker using a vibrating plate as claimed. The combination of Kang in view of Sakai further teaches that the voice coil (Kang, fig 2 element 25A) is connected with an outgoing line (Kang, an electrode, column 5 lines 7-8), and that there is a connection terminal (Kang, PCB terminal, fig. 2 element 20, column 5 lines 1-3) connected to the receiver through one side of the frame, but does not explicitly state that the outgoing line is passed through a hole in the body and is connected to the connection terminal. However, Han does explicitly disclose that the outgoing line (Han, coil, fig 2 element 13) is passed through a through hole formed in the body and is connected to a connection terminal, (Han, electrode terminal plate, fig 2 element 11) formed on an outer side of the body, and to the voice coil (Han, page 9 lines 12 -23). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize Han's connection terminal on the body of the speaker of the combination of Kang in view of Sakai to prevent direct pulling on the voice coil and damage to the speaker.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kang et al. in view of Sakai in further view of Bank U.S. Patent No. 6,885,753.

Regarding claim 6, Kang discloses a phone having a bone conduction speaker using a vibrating plate comprising: a body having a shape of a cylinder of which upper portion is opened (fig 2 element 21, frame); a yoke (fig 2 element 22, column 4 lines 4-5) which is disposed in a lower portion of the body and of which center has a protrusion; a ring type magnet (fig 2 element 23, column 4 lines 6-8) which is formed on the edge of the yoke and apart from an end portion of the protrusion by a predetermined clearance (column 4 lines 6-9); an upper plate which is formed on the magnet (fig 2 element 24, column 4 lines 9-10); a mastoid (fig 2 element 30, vibration contact portion) to transmit a vibration to a skull of a user (fig 3, column 3 lines 27-30 and column 4 lines 40-44) for stimulating an auditory nerve of the user; an acoustic vibrating plate (fig 2 element 27, vibrating plate) which is inserted at a lower side of the mastoid to cover the opening portion of the body and which is made of an elastic material; an auxiliary vibrating plate (fig 2 element 28, coil cap), which is inserted under the acoustic vibrating plate which is inserted to the mastoid; a voice coil (fig 2 element 25A, column 3 lines 64-67) which is attached to the auxiliary vibrating plate and which is inserted between the end portion of the protrusion of the yoke and the ring type magnet (column 4 lines 6-17); a front cap (fig 2 element 29, vibration stabilizer) for fixing the acoustic vibrating plate on the body; and an electrical signal input unit (fig 1 element 5, amplifying circuit, column 5 lines 58-61) for inputting an electric signal to the voice coil. Kang does not explicitly teach that the acoustic vibrating plate (fig 2 element 27, vibrating plate) is made of elastic material. However, the use of elastic materials for acoustic vibrating plates is well known in the art and Sakai teaches an acoustic vibrating plate (fig. 1B element 5, suspension plate) is made of the elastic material (Sakai, column 3 lines 40-43).

Therefore, It would have been obvious to one of ordinary skill in the art, at the time of Kang's

Art Unit: 2615

invention to a well-known elastic spring material for the acoustic vibrating plate as taught by Sakai for elastically suspending the vibrating member (See Sakai col. 3, lines 8-18). The combination of Kang in view of Sakai does not expressly disclose the use of the bone conduction speaker in a mobile phone. However, the use of bone conduction speakers in a mobile phone is well known in the art and Bank teaches a mobile phone (58) comprising a bone conduction speaker (65) (See Bank Fig. 1a and col. 5, line 66 to col. 6, line 8). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to bone conduction speaker of the combination of Kang in view of Sakai in a mobile phone for portability of use.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kang in view of Sakai as in claims 1 and 6 above) and in further view of Schumaier U.S. Patent Publication No. 2002/0122563.

Regarding claims 7 and 8, the combination of Kang in view of Sakai teaches a subminiature bone conduction speaker using a vibrating plate and a mobile phone having a bone conduction speaker as in claims 1 and 6 above, but do not expressly claim the mastoid is comprised of plastic material. However, Schumaier does teach that the body of the bone conduction speaker, which includes the mastoid, is made of plastic (Schumaier, paragraph [0023]). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to make the mastoid of the combination of Kang in view of out of plastic so as to easily transfer the vibrations of the receiver to the head (Schumaier, paragraph [0023]) and also to be able to employ mass production methods that will allow for easy and cheap manufacture of the parts of the subminiature bone conduction speaker.

Art Unit: 2615

Allowable Subject Matter

Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Ensey whose telephone number is 571-272-7496. The examiner can normally be reached on Monday - Friday 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
P.O. Box 1450
Alexandria, Va. 22313-1450

Or faxed to:

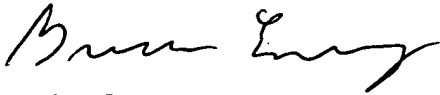
(571) 273-8300, for formal communications intended for entry and for informal or draft communications, please label "PROPOSED" or "DRAFT".
Hand-delivered responses should be brought to:

Customer Service Window
Randolph Building
401 Dulany Street

Art Unit: 2615

Arlington, VA 22314

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Brian Ensey
Examiner
January 16, 2006